FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A" Grade by NAAC (3rd Cycle)
74th Rank in India Ranking 2020 (NIRF) by MHRD
Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : ZOOLOGY

NAME OF THE PROGRAMME : B.Sc. ZOOLOGY

PROGRAMME CODE : UAZO

ACADEMIC YEAR : 2020 - 2021

2020-2021

Minutes of the UG Board of Studies Meeting held on 28.02.2020 at 2.00 pm in the Zoology Lab, Department of Zoology, Fatima College (Autonomous), Madurai-18.

Members present for the UG Board of Zoology

1. Dr. K.S. Malar (University Nominee)
2. Dr. F. Brisca Renuga (Subject Expert - Zoology)
3. Dr. D. Illakkiam (Subject Expert - Zoology)
4. Dr. C. Gowri Priya (Scientist)
5. Dr. M. Kalaiarasi (Alumnus) 28/02/2020
6. Dr. B. Karunai Selvi (Subject Expert - Botany) 28/02/2020
7. Dr. N. Malathi (Academic Dean) 28/2/2020
8. Dr. A. Tamil Selvi 28/02/20
9. Dr. Antony Amala Jayaseeli 28/02/2020
10. Dr. N. Malathi
11. Dr. J. Asnet Mary 28/2/2020
12. Dr. Sr. Biji Cyriac
13. Dr. V. Bharathy
14. Dr. N. Nagarani
15. Dr. S. Barathy
16. MS. T. Malar Meenakshi

The suggestion & the changes carried out in the I & II semester Syllabi of I B.Sc Zoology during the UG Board of studies Meeting of Zoology (2019-20) were presented briefly as the Action Taken Report.

The course contents with course outcomes (CO) for all the course of II B.Sc Zoology were prepared as per the norms of Outcome Based Education (OBE) and presented for the approval in the present Board of Studies Meeting.

The Syllabi for the III & IV Semester

of II B.Sc Zoology were discussed in detail and the following courses were approved by the Board.

Semester III - Courses reviewed :-

Major core 1) Human Physiology (19Z3CC7)
2) Environmental Biology (19Z3CC8)

Lab in Human Physiology & Environmental Biology (19Z3CC9)

Skill Based - Vermitechnology

Semester IV - Courses reviewed :-

Major core 1) MicroBiology (19Z4CC10)
2) Evolution (19Z4CC11)

Lab in MicroBiology & Evolution (19Z4CC12)

Skill Based - Mushroom Cultivation

The following changes were suggested by the members of UG Board of Studies Meeting of Zoology :-

The unit Title for the Unit III of the Major core course - Human Physiology (19Z3CC7) can be changed as 'Urogenital System'. Content on 'Absorption of minerals & Vitamins can be specified in Unit I (% Syllabus Revision - NIL)

'Identification of plant diseases' can be included under 'spotters' in the Lab course (Allied Practical) - Lab in Plant Diversity, Plant Pathology & Economic Botany (19Z3AC02). (Percentage of Syllabus Revision - NIL).

The topics 'Transformation & Transduction can be included in Unit II of the Major core course - Microbiology (19Z4CC10) - (Percentage of Syllabus Revision is NIL) in place of the term 'Recombination'.

Demonstration of Anaerobic Respiration can be included in the Allied Botany Lab course - Lab in Plant Anatomy, Physiology, Embryology,

plant breeding and Horticulture (19Z4ACQ4). Percentage of Syllabus Revision is NIL).

The self Learning course - 'Public Health & Hygine' (19UGSLZ1) was scrutinized & approved by the Board Members.

Self-Study topics for the I, II & III UG courses were discussed with the Board Members & approved by the Board Members. A List of Recommended MOOC Online courses (offered by SWAYAM PORTAL) and List of Practical/ Project viva external examiners were also presented in the Board.

The Strategy and Pedagogy, currently followed for the Remedial coaching for the I UG Students were shared with the Board Members and their Suggestions regarding the enrichment of the Remedial programmewere noted down.

The Feed back / Evaluation for the course contents and the curriculum were also received from the External Members of Annual Upgradation of Syllabus (BOS) Meeting for the Academic year 2020 - 2021.

Members -

1. Dr. K.S. Malar
2. Dr. F. Brisca Renuga
3. Dr. D. Illakkiam
4. Dr. C. Gowri Priya
5. Dr. M. Kalaiarasi 28/02/2020
6. Dr. B. Karurai Selvi 28/02/2020
7. Dr. N. Malathi

8. Dr. A. Tamil Selvi — 28/02/2020
9. Dr. Antony Amala Jayaseeli — 28/02/2020
10. Dr. N. Malathi — 28/2/2020
11. Dr. J. Asnet Mary — 28/2/2020
12. Dr. Sr. Biji Cyriac
13. Dr. V. Bharathy
14. Dr. N. Nagarani
15. Dr. S. Barathy
16. MS. T. Malar Meenakshi

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF ZOOLOGY

B.Sc ZOOLOGY-Syllabus -2020-2021

For those who joined in June 2019 onwards

I & II B.Sc Zoology

PROGRAMME CODE : UAZO

PART – I – TAMIL / FRENCH / HINDI– 12 CREDITS

PART – I – TAMIL

Offered by The Research Centre of Tamil

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19TLC1	Language-Modern Literature	5	3	40	60	100
2.	II	19TLC2	Language - Bakthi Literature	5	3	40	60	100
3.	III	19TLC3	Language- Epic Literature	5	3	40	60	100
4.	IV	19TLC4	Language-Sangam Literature	5	3	40	60	100
			Total	20	12			

PART – I – FRENCH

Offered by The Department of French

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19RLC1	PART 1 LANGUAGE FRENCH	5	3	40	60	100
2.	II	19RLC2	PART 1 LANGUAGE FRENCH	5	3	40	60	100
3.	III	19RLC3	PART 1 LANGUAGE FRENCH	5	3	40	60	100
4.	IV	19RLC4	PART 1 LANGUAGE FRENCH	5	3	40	60	100
			Total	20	12			

PART – I – HINDI

Offered by The Department of Hindi

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DLC1	PART 1 LANGUAGE HINDI	5	3	40	60	100
2.	II	19DLC2	PART 1 LANGUAGE HINDI	5	3	40	60	100
3.	III	19DLC3	PART 1 LANGUAGE HINDI	5	3	40	60	100
4.	IV	19DLC4	PART 1 LANGUAGE HINDI	5	3	40	60	100
			Total	**20**	**12**			

PART – II -ENGLISH – 12 CREDITS

Offered by The Research Centre of English

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19E1LB1	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		19E1LI1	INTERMEDIATE COMMUNICATIVE ENGLISH	5	3	40	60	100
3.		19E1LA1	ADVANCED COMMUNICATIVE ENGLISH	5	3	40	60	100
4.	II	19E2LB2	ENGLISH COMMUNICATION SKILLS (BASIC)	5	3	40	60	100
5.		19E2LI2	ENGLISH FOR EMPOWERMENT (INTERMEDIATE)	5	3	40	60	100
6.		19E2LA2	ENGLISH FOR CREATIVE WRITING (ADVANCED)	5	3	40	60	100
7.	III	19ELC3	ENGLISH FOR DIGITAL ERA	5	3	40	60	100
8.	IV	19ELC4	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
			Total	**20**	**12**			

PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks

1.	I	19Z1CC1	INVERTEBRATA	5	4	40	60	100
2.		19Z1CC2	CELL BIOLOGY	4	3	40	60	100
3.		19Z1CC3	LAB IN INVERTEBRATA & CELL BIOLOGY	3	2	40	60	100
4.	II	19Z2CC4	CHORDATA	5	4	40	60	100
5.		19Z2CC5	GENETICS	4	3	40	60	100
6.		19Z2CC6	LAB IN CHORDATA & GENETICS	3	2	40	60	100
7.	III	19Z3CC7	HUMAN PHYSIOLOGY	5	4	40	60	100
8.		19Z3CC8	ENVIRONMENTAL BIOLOGY	4	3	40	60	100
9.		19Z3CC9	LAB IN HUMAN PHYSIOLOGY & ENVIRONMENTAL BIOLOGY	3	2	40	60	100
10.	IV	19Z4CC10	MICROBIOLOGY	5	4	40	60	100
11.		19Z4CC11	EVOLUTION	4	3	40	60	100
12.		19Z4CC12	LAB IN MICROBIOLOGY& EVOLUTION	3	2	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19Z1ACC1	ALLIED CHEMISTRY- I	3	3	40	60	100
2.		19Z1ACC2	LAB IN VOLUMETRIC ANALYSIS	2	2	40	60	100
3.	II	19Z2ACC3	ALLIED CHEMISTRY- II	3	3	40	60	100
4.		19Z2ACC4	LAB IN QUALITATIVE	2	2	40	60	100

			ORGANIC ANALYSIS					
5.	III	19Z3ACQ1	PLANT DIVERSITY & PLANT PATHOLOGY	3	3	40	60	100
6.		19Z3ACQ2	LAB- PLANT DIVERSITY & PLANT PATHOLOGY	2	2	40	60	100
7.		19C3ACZ1	ANIMAL DIVERSITY, PHYSIOLOGY & GENETICS	3	3	40	60	100
8.		19C3ACZ2	LAB- ANIMAL DIVERSITY, PHYSIOLOGY & GENETICS	2	2	40	60	100
9.	IV	19Z4ACQ3	DEVELOPMENTAL BOTANY &PLANT BREEDING	3	3	40	60	100
10.		19Z4ACQ4	LAB-DEVELOPMENTAL BOTANY &PLANT BREEDING	2	2	40	60	100
11.		19C4ACZ3	CELL & MOLECULAR BIOLOGY	3	3	40	60	100
12.		19C4ACZ4	LAB- CELL & MOLECULAR BIOLOGY	2	2	40	60	100

PART – IV – 20 CREDITS

S.No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19G1VE	Value Education (Including Meditation in Action Movement)	1	1	40	60	100
2.		19Z1NME	Non Major Elective - Maternity and Child Health (Offered to other major Students)	2	2	40	60	100
3.	II	19G2VE	Value Education	1	1	40	60	100

4.		19Z2NME	Non Major Elective - Maternity and Child Health (Offered to other major Students)	2	2	40	60	100
5.	III	19G3EE	Environmental Education	1	1	40	60	100
6.		19Z3SB1	Vermitechnology	2	2	40	60	100
7.	IV	19G4EE	Environmental Education	1	1	40	60	100
8.		19Z4SB2	Mushroom Cultivation	2	2	40	60	100

III UG Zoology – Syllabus

SYLLABUS OFFERED FROM JUNE 2018 ONWARDS

Sem	Sub Code	Title	Hrs	Credits	Test	Assi	Qui	Int	Ext	Tot
V	Z5CC11	CORE SUBJECT (1) BIOCHEMISTRY	6	5	15	5	5	25	75	100
	Z5CC12	(2) MOLECULAR BIOLOGY	5	5	15	5	5	25	75	100
	Z5CC13	(3)BIOPHYSICS& INSTRUMENTATION	4	4	15	5	5	25	75	100
	Z5ME1/ Z5ME2	MAJORELECTIVE(1) EMBRYOLOGY/ ENTOMOLOGY	5	5	15	5	5	25	75	100
	Z5SB3	SKILL BASED SUBJECT(1) ORNAMENTAL FISH CULTURE	2	2	30	10	10	50	50	100
	Z5SB4	(2)SERICULTURE	2	2	30	10	10	50	50	100
	Z6CC16	MAJOR PRACTICAL-III	6	-	-	-	-	-	-	-
			30	23						
VI	Z6CC14	CORE SUBJECT (1) IMMUNOLOGY	5	5	15	5	5	25	75	100
	Z6CC15	(2) BIOTECHNOLOGY	5	5	15	5	5	25	75	100
	Z6ME3/ Z6ME4	MAJOR ELECTIVE (1) BIOSTATISTICS / CLINICAL LABORATORY TECHNIQUE	5	5	15	5	5	25	75	100
	Z6ME5/ Z6ME6	(2) BIOINFORMATICS / HUMAN GENETICS	5	5	15	5	5	25	75	100
	Z6SB5	SKILL BASED SUBJECT (1) APICULTURE	2	2	30	10	10	50	50	100
	Z6SB6	(2) DAIRY FARMNG	2	2	30	10	10	50	50	100
	Z6CC16	MAJOR PRACTICAL-III	6	6	-	-	-	40	60	100
			30	30						
		Mandatory Total Credits		140						
		Add on credits		20						
		TOTAL		160						

Add on credits

Courses	Semester	Credits	Marks
Computer Literacy	**I – Science; II - Arts**	**2**	**100**
Foundation course – Arts and science	**I & II**	**3+3**	**50+50**
Meditation Action Movement	**I-IV**	**2**	**100**
Human Rights	**V**	**2**	**100**
Out Reach Programmes	**V & VI**	**3**	**100**
Project	**VI**	**4**	**100**
Reading Culture	**I-VI**	**1**	**-**
TOTAL		**20**	

II B.Sc.

SEMESTER – III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAZO	19Z3CC9	LAB IN HUMAN PHYSIOLOGY & ENVIRONMENTAL BIOLOGY	Practical	3	2

COURSE DESCRIPTION

The course focuses on the interactions between organisms and the environment, and the consequences of these interactions in natural populations, communities and ecosystems through experimental approach

COURSE OBJECTIVES

- To gain skills in analyzing the clinical and environmental samples and to learn basic techniques in human physiology and environmental biology
- To understand the functioning of organisms at the molecular, cellular, organ and organism level.

HUMAN PHYSIOLOGY

1. Effect of pH and Temperature on salivary amylase activity in man
2. Preparation of haemin and haemochromogen Crystals
3. Test for proteins - Qualitative analysis of proteins – Ninhydrin and Biuret
4. Analysis of blood Sugar and Urea
5. Analysis of Urine Sugar and Albumin
6. Qualitative analysis of urea, ammonia and creatinine
7. Estimation of Uric Acid
8. Spotters - ECG, BMI Chart
9. Spotters - Hormonal disorders – Gigantism, Cretinism, Diabetes & Goitre

ENVIRONMENTAL BIOLOGY

1. Estimation of Dissolved O_2 and CO_2 in given water samples
2. Measure pH of different water samples using pH meter, pH paper and indicator solution.
3. Model preparation of food chain, food web in different ecosystem
4. Spotters - *Mysis*, *Lucifer*, *Calanus* and *Zoea*

REFERENCES:

1. Rajan S., Christy, S.R., (2011). *Experimental procedures in Life Sciences*, Anjana Book House, Chennai.
2. Sinha J., Chatterjee A.K., Chattopadhyay P., (2015). *Advanced Practical Zoology*, Books and Allied (P) Ltd., Calcutta.
3. Tembhare D.B., (2008). *Techniques in Life Sciences,* 1st edition., Himalaya Publishing House Pvt. Ltd., Mumbai.
4. Dutta A., (2009). *Experimental Biology Lab manual,* Narosa Publishing House, New Delhi.

DIGITAL OPEN EDUCATIONAL RESOURCES

1. **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6825871/**
2. **https://www.youtube.com/watch?v=kwRgNNI6xrM**
3. **https://www.youtube.com/watch?v=frtln5ZoeNQ**
4. **https://www.youtube.com/watch?v=frtln5ZoeNQ&t=286s**
5. **https://www.youtube.com/watch?v=OsdhNtNNNds**

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 HUMAN PHYSIOLOGY				
1.1	Effect of pH and Temperature on salivary amylase activity in man	3	Demonstration & hands on training	Human saliva
1.2	Preparation of haemin and	3	Demonstration & hands on	Human

	haemochromogen Crystals		training	Blood
1.3	Test for proteins - Qualitative analysis of proteins – Ninhydrin and Biuret	3	Demonstration & hands on training	Protein Sample
1.4	Analysis of blood Sugar and Urea	3	Demonstration & hands on training	Human Blood
1.5	Analysis of Urine Sugar and Albumin	3	Demonstration & hands on training	Urine sample
1.6	Qualitative analysis of urea, ammonia and creatinine	3	Demonstration & hands on training	
1.7	Estimation of Uric Acid	3	Demonstration & hands on training	
1.8	Spotters - ECG, BMI Chart	3	Discussion	Spotters
1.9	Spotters - Hormonal disorders – Gigantism, Cretinism, Diabetes & Goitre	3	Discussion	Spotters
UNIT -2 ENVIRONMENTAL BIOLOGY				
2.1	Estimation of Dissolved O_2 and CO_2 in given water samples	3	Demonstration & hands on training	Green Board Charts
2.2	Measure pH of different water samples using pH meter, pH paper and indicator solution.	3	Demonstration & hands on training	Green Board
2.3	Model preparation of food chain, food web in different ecosystem	3	Model	
2.4	Spotters - *Mysis*, *Lucifer*, *Calanus* and *Zoea*	3	Discussion	Preserved slides

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5 Mks	M1+M2 5+5=10 Mks.	MID-SEM TEST 15 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	7.5	-	7.5	18.75 %
K2	-	5	4	2 ½	11.5	-	11.5	28.75 %
K3	-	-	3	5	8	-	8	20 %
K4	-	-	3	5	8	-	8	20 %
Non Scholastic	-	-	-	-		5	5	12.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

Nos

C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Associate the effect of pH and temperature on salivary amylase activity in man.	K1	PSO1, PSO2 PSO3
CO 2	Infer the qualitative analysis and estimation of biomolecules.	K1	PSO2, PSO7
CO 3	Compare the preparation of haemin and haemochromogen crystals.	K2	PSO2, PSO5, PSO6
CO 4	Determine the amount of dissolved oxygen and carbon dioxide in the given water samples.	K2	PSO2, PSO7
CO 5	Prepare the models for food chain and food web in different ecosystem and identification of	K2	PSO2, PSO7

	spotters.		

Mapping COs Consistency with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12
CO1	3	3	3	-	-	-		-	-	-	-	-
CO2	-	3	-	-	-	-	3	-	-	-	-	-
CO3	-	2	-	-	3	3		-	-	-	-	-
CO4	-	3	-	-	-	-	3	-	-	-	-	-
CO5	-	3	-	-	-	-	3	-	-	-	-	-

Mapping of COs with POs

CO/PSO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	-	2
CO2	2	3	2	-	1
CO3	3	3	3	-	2
CO4	3	3	3	-	2
CO5	3	3	3	-	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr. Sr. Biji Cyriac

Forwarded By

Dr. A. TAMIL SELVI
Head, Dept. of Zoology
FATIMA COLLEGE (AUTONOMOUS)
MADURAI-625 018

HOD'S Signature & Name

II B.Sc.

SEMESTER –III

For II B.Sc Chemistry those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAZO	**19C3ACZ2**	**Lab - Animal Diversity, Physiology & Genetics**	**Practical**	**2**	**2**

COURSE DESCRIPTION

Students develop laboratory skills with identification of preserved specimen, manipulation of prepared slides, dissections and display under the microscope

COURSE OBJECTIVES

To study the diversity of animals and to understand the fundamental organization of cells.

INTRODUCTION

1. Laboratory biosafety guidelines and Regulations of Animal Ethics
2. Principle and handling of Compound microscope

ANIMAL DIVERSITY

1. Mounting of Body setae of Earthworm. (Collected from Vermiculture Centres)
2. **SPOTTERS**: Preserved Museum Specimens
3. Invertebrata - *Amoeba*, *Ascaris* (Male & Female), Prawn, Octopus, Starfish (Oral & Aboral view): Chordata – *Anguilla* (Eel), Toad (Bufo), Chamaeleon, Pigeon, Manis

HUMAN PHYSIOLOGY

1. Preparation and observation of blood smear

2. ABO Blood Grouping
3. Preparation of Haemin Crystals
4. Qualitative analysis of urea and uric acid in the given sample.
5. Effect of temperature on salivary amylase activity in man
6. **SPOTTERS**: Eye, Ear, Heart

GENETICS

1. Observation of simple Mendelian Traits in the class Population
2. **SPOTTERS**: Drosophila, Mule, Monohybrid cross, Syndrome

REFERENCES

1. Rajan S., Christy, S.R., (2011) *Experimental procedures in Life Sciences*, Anjana Book House, Chennai.
2. Sinha J., Chatterjee A.K., Chattopadhyay P., (2015) *Advanced Practical Zoology*, Books and Allied (P) Ltd., Calcutta.
3. Tembhare D.B., (2008) *Techniques in Life Sciences*, 1st ed., Himalaya Publishing House Pvt. Ltd., Mumbai.
4. Dutta A., (2009) *Experimental Biology Lab manual*, Narosa Publishing House, New Delhi.

DIGITAL OPEN EDUCATIONAL RESOURCES

1. https://www.uwlax.edu/biology/zoo-lab/
2. http://virtualbiologylab.org/
3. https://www.labster.com/simulations/animal-genetics/
4. https://libguides.mines.edu/oer/simulationslabs
5. https://www.biodiversitylibrary.org/item/29076#page/5/mode/1up

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
ANIMAL DIVERSITY				

1.1	Mounting of Body setae of Earthworm. (Collected from Vermiculture Centers)	2	Hands on Training	Specimen
1.2	Invertebrata - Amoeba, Ascaris (Male & Female), Prawn,	2	Discussion	Museum Specimen
1.3	Octopus, Starfish (Oral & Aboral view)	2	Discussion	Museum Specimen
1.4	Chordata – *Anguilla* (Eel), Toad (Bufo),	2	Discussion	Museum Specimen
1.5	Chamaeleon, Pigeon, Manis	2	Discussion	Museum Specimen
HUMAN PHYSIOLOGY				
2.1	Preparation and observation of blood smear	1	Hands on Training	Blood Sample
2.2	ABO Blood Grouping	1	Hands on Training	Blood Grouping Kit
2.3	Preparation of Haemin Crystals	2	Hands on Training	Microscope
2.4	Qualitative analysis of urea and uric acid in the given sample.	2	Hands on Training	Specimen
2.5	Effect of temperature on salivary amylase activity in man	2	Hands on Training	Stop Clock, Water bath
2.6	SPOTTERS: Eye, Ear, Heart	2	Discussion	Museum Specimen

Genetics				
3.1	Observation of simple Mendelian Traits in the class Population	2	Hands on Training/Discussion	Black Board
3.2	SPOTTERS: Drosophila, Mule, Monohybrid cross, Syndrome	2	Discussion	Museum Specimen

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5 Mks	M1+M2 5+5=10 Mks.	MID-SEM TEST 15 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**5**	**-**	**-**	**2 ½**	**7.5**	-	**7.5**	18.75 %
K2	**-**	**5**	**4**	**2 ½**	**11.5**	-	**11.5**	28.75 %
K3	**-**	**-**	**3**	**5**	**8**	-	**8**	20 %
K4	**-**	**-**	**3**	**5**	**8**	-	**8**	20 %
Non Scholastic	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**5**	**5**	**10**	**15**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

**** The best out of two will be taken into account***

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline the Laboratory biosafety guidelines and good laboratory practices.	K1	PSO1, PSO2 & PSO7
CO 2	Dissect and mount the Body setae of Earthworm	K4	PSO1, PSO2,PSO4&

			PSO7
CO 3	List out the features of the given spotters *Amoeba, Taenia solium*, *Nereis*, *Amphioxus* (entire), *Anguilla* (Eel), Toad (*Bufo*), Cobra, Chamaeleon, Pigeon and various Syndromes.	K1	PSO1, PSO7 & PSO8
CO 4	Choose the appropriate qualitative test for the analysis of carbohydrates, proteins, lipids, urea and uric acid in the given sample	K3	PSO2 &PSO4
CO 5	Illustrate the structure of human ear, eye and heart.	K2	PSO1 & PSO4

Mapping of COs with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO1 0	PSO1 1	PSO1 2
CO1	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**
CO4	**3**	**-**	**-**	**3**	**-**	**-**	**3**	**2**	**-**	**-**	**-**	**-**
CO5	**-**	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**2**	**-**	**1**	**3**
CO2	**3**	**2**	**-**	**1**	**3**
CO3	**3**	**-**	**-**	**1**	**3**
CO4	**3**	**-**	**-**	**1**	**3**
CO5	**3**	**-**	**-**	**1**	**3**

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:
Dr. N.Nagarani

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HOD'S Signature & Name

III B.Sc.

SEMESTER –VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAZO	**19Z4CC12**	**Lab in Microbiology & Evolution**	**Practical**	**3**	**2**

COURSE DESCRIPTION

To gain skills in analyzing the clinical and environmental samples and to learn basic techniques in microbiology and evolution

COURSE OBJECTIVES

- Understand the basic principles of Microbiology.
- Develop skills and competence in standard microbiological laboratory techniques.
- Demonstrate the natural selection and Hardy-Weinberg Equilibrium

UNITS

UNIT –I MICROBIOLOGY

1. Laboratory biosafety Measures
2. Working Principle and Applications of Autoclave, Laminar Air Flow, Incubator and pH meter
3. Staining - Simple, Negative and Gram Staining
4. Preparation of Media- agar and broth
5. Serial Dilution Technique
6. Isolation of Single Colony using Pour plate, Streak plate, Spread plate.
7. Water quality analysis -MPN method Hanging drop method

UNIT –II EVOLUTION

1. Animals of Evolutionary Importance - *Peripatus*, *Limulus* and *Archaeopteryx*
2. Mimicry- Leaf insect and Stick Insect
3. Animals with adaptive coloration – Chameleon

4. Horse Evolution model
5. Human evolution model
6. Homologus organs – forelimb and skeletal of vertebrates
7. Analogus – Wing modification
8. Hardy-Weinberg Equilibrium by using beads
9. Natural selection by using beads

REFERENCES:

1. Sinha J., Chatterjee A.K., Chattopadhyay P. (2015). *Advanced Practical Zoology,* Books and Allied (P) Ltd., Calcutta.
2. Armugam, N., & Narayan L.M., (2013). *Practical Zoology (3).* Saras publication, Tamil Nadu.
3. Rajan S., Christy, S.R. (2011). *Experimental procedures in Life Sciences*, Anjana Book House, Chennai.
4. Dutta A. (2009). *Experimental Biology Lab manual*, Narosa Publishing House, New Delhi.
5. Tembhare D.B. (2008). *Techniques in Life Sciences,* 1st edition., Himalaya Publishing House Pvt. Ltd., MumbaI

DIGITAL OPEN EDUCATION RESOURCES

1. http://www.uwyo.edu/molb2021/virtual-edge/
2. http://www.evo-ed.org/index.htm
3. http://oer2go.org/mods/en-boundless/www.boundless.com/microbiology/textbooks/boundless-microbiology-textbook/industrial-microbiology-17/index.html
4. https://www.merlot.org/merlot/viewMaterial.htm?id=484489821

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 MICROBIOLOGY				
1.1	Laboratory biosafety Measures	3	Discussion	
1.2	Working Principle and	3	Discussion	Instrume

	Applications of Autoclave, Laminar Air Flow, Incubator and pH meter			nts
1.3	Staining - Simple, Negative and Gram Staining	3	Hands on training	Slides & Microscope
1.4	Preparation of Media- agar and broth	3	Demonstration & hands on training	Nutrient Agar & broth
1.5	Serial Dilution Technique	3	Demonstration	Sample
1.6	Isolation of Single Colony using Pour plate, Streak plate, Spread plate.	3	Demonstration	Sample from serial dilution technique
1.7	Water quality analysis - MPN method Hanging drop method	3	Demonstration & Hands on training	Culture
UNIT -2 EVOLUTION				
2.1	Animals of Evolutionary Importance - *Peripatus*, *Limulus* and *Archaeopteryx*	3	Demonstration	Spotters
2.2	Mimicry- Leaf insect and Stick Insect	3	Demonstration	Spotters
2.3	Animals with adaptive coloration – Chameleon	3	Demonstration	Spotters
2.4	Horse Evolution model Human evolution model	3	Demonstration	Spotters
2.5	Homologus organs – forelimb and skeletal of vertebrates	3	Demonstration	Spotters

2.6	Analogus – Wing modification	3	Demonstration	Spotters
2.7	Hardy-Weinberg Equilibrium by using beads	3	Demonstration & hands on training	Beads
2.8	Natural selection by using beads	3	Demonstration & hands on training	Beads

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5 Mks	M1+M2 5+5=10 Mks.	MID-SEM TEST 15 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**5**	**-**	**-**	**2 ½**	**7.5**	-	**7.5**	18.75 %
K2	**-**	**5**	**4**	**2 ½**	**11.5**	-	**11.5**	28.75 %
K3	**-**	**-**	**3**	**5**	**8**	-	**8**	20 %
K4	**-**	**-**	**3**	**5**	**8**	-	**8**	20 %
Non Scholastic	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**5**	**5**	**10**	**15**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	CO 1 Find the working Principle and Applications of instruments.	K1	PSO1, PSO2

CO 2	Demonstrate the microbiological techniques and water quality analysis	K3	PSO2, PSO7
CO 3	Identify the animals of evolutionary importance, adaptive coloration and in mimicry.	K3	PSO1, PS02 PSO7
CO 4	Identify the morphological evidences and the horse and human evolution model.	K3	PSO2, PSO7
CO 5	Analyze the Hardy – Weinberg equilibrium using beads.	K3	PSO1, PSO2, PSO8

Mapping COs Consistency with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	3	-	-	-	-	-
CO3	3	2	-	-	-	-	3	-	-	-	-	-
CO4	-	3	-	-	-	-	3	-	-	-	-	-
CO5	3	3	-	-	-	-	-	2	-	-	-	-

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	-	3
CO2	2	3	3	-	3
CO3	2	3	3	-	3
CO4	2	3	2	-	3
CO5	2	3	1	-	2

Note: ♦ Strongly Correlated – **3** ♦ ModeratelyCorrelated – **2**
♦ WeaklyCorrelated -**1**

COURSE DESIGNER:
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II B.Sc.

SEMESTER –IV

For II B.Sc Chemistry those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAZO	**19C4ACZ4**	**Lab - Cell & Molecular Biology**	**Practical**	**2**	**2**

COURSE DESCRIPTION

Students develop laboratory skills with identification of preserved specimen, manipulation of prepared slides, dissections and display under the microscope

COURSE OBJECTIVES

To study the life science application in molecular field

UNIT

CELL BIOLOGY

1. Laboratory rules and regulations
2. Microscopic observation of squamous epithelial cheek cells
3. Squash preparation of mitotic stages in Onion root tip.
4. Preparation and identification of Polytene Chromosomes in the Salivary gland of *Chironomus* larva

Spotters: Stages of Meiosis, Cellular organelles – Mitochondria, Endoplasmic reticulum, Golgi complex, Nucleus, Ribosome

MOLECULAR BIOLOGY

1. Isolation of DNA from onion bulb (demo).

Spotters: DNA Model, DNA Replication

REFERENCES

1. Rajan S., Christy, S.R., (2011) *Experimental procedures in Life Sciences*, Anjana Book House, Chennai.
2. Sinha J., Chatterjee A.K., Chattopadhyay P., (2015) *Advanced Practical Zoology,* Books and Allied (P) Ltd., Calcutta.
3. Tembhare D.B., (2008) *Techniques in Life Sciences*, 1st ed., Himalaya Publishing House Pvt. Ltd., Mumbai.
4. Dutta A., (2009) *Experimental Biology Lab manual*, Narosa Publishing House, New Delhi.

DIGITAL OPEN EDUCATIONAL RESOURCES

1. http://vlabs.iitb.ac.in/vlabs-dev/labs/zoology_lab/labs/exp1/index.php
2. https://www.uwlax.edu/biology/zoo-lab/
3. https://learn5.open.ac.uk/course/format/sciencelab/section.php?name=btm_sdk100
4. http://virtualbiologylab.org/
5. https://www2.le.ac.uk/projects/vgec/highereducation/topics/dna-genes-chromosomes

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
CELL BIOLOGY				
1.1	Laboratory rules and regulations	2	Discussion	PPT
1.2	Microscopic observation of squamous epithelial cheek cells	2	Hands on Training	Microscope

1.3	Squash preparation of mitotic stages in Onion root tip.	2	Hands on Training	Microscope
1.4	Preparation and identification of Polytene chromosomes in the Salivary gland of *Chironomus* larva	2	Hands on Training	Microscope
1.5	Spotters : Stages of Meiosis	2	Discussion	LCD/PPT
1.6	Sub topics: Mitochondria, Endoplasmic reticulum, Golgi complex, Nucleus, Ribosome	2	Discussion	LCD/PPT
1.7	Sub topics: Golgi complex, Nucleus, Ribosome	2	Discussion	LCD/PPT
MOLECULAR BIOLOGY				
2.1	Isolation of DNA from onion bulb (demo).	2	Hands on Training	Blood Sample
2.2	Spotters: DNA Model	2	Discussion	Model
2.3	DNA Replication	2	Discussion	Model

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average	Better of W1, W2	M1+M2	MID-SEM TEST				
	5 Mks.	5 Mks	5+5=10 Mks.	15 Mks	35 Mks.	5 Mks.	40Mks.	

K1	**5**	**-**	**-**	**2 ½**	**7.5**	**-**	**7.5**	18.75 %
K2	**-**	**5**	**4**	**2 ½**	**11.5**	**-**	**11.5**	28.75 %
K3	**-**	**-**	**3**	**5**	**8**	**-**	**8**	20 %
K4	**-**	**-**	**3**	**5**	**8**	**-**	**8**	20 %
Non Scholastic	**-**	**-**	**-**	**-**		**5**	**5**	12.5 %
Total	**5**	**5**	**10**	**15**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					**NON - SCHOLASTIC**	**MARKS**		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks

C6 - Attendance - 5 Mks

**** The best out of two will be taken into account***

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Identify the squamous epithelial cells under microscope	**K3**	PSO1& PSO2
CO2	Dissect and mount the Polytene Chromosomes in the Salivary gland of *Chironomus* larva.	**K4**	PSO1, PSO2, PSO4 &PSO7
CO 3	Interpret the mitotic stages from the squash preparation in Onion root tip	**K2**	PSO1,PSO2 & PSO7
CO 4	Recognize the features of the given spotters: Stages of Meiosis, Cellular organelles – Mitochondria, Endoplasmic reticulum, Golgi complex, Nucleus	**K1**	PSO1, PSO4 & PSO10
CO5	Recall the structure and replication of DNA	**K1**	PSO1, PSO4 & PSO10

Mapping of COs with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11
CO1	**3**	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	**3**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**

CO3	3	3	-	3	-	-	2	-	-	3	-
CO4	3	3	-	-	-	-	2	-	-	3	-
CO5	3	-	-	3	-	-	-	2	-	3	-

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	-	-	-	3
CO2	3	-	-	-	3
CO3	3	2	-	-	3
CO4	3	-	-	-	3
CO5	3	-	-	2	3

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:
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II B.Sc.

SEMESTER –IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAZO	19Z4SB2	MUSHROOM CULTIVATION	Lecture	2	2

COURSE DESCRIPTION

Develop basic knowledge in mushroom cultivation and spawn production

COURSE OBJECTIVES

To understand the value of edible mushrooms, know the cultivation process and thereby increase the employability

UNITS

UNIT –I INTRODUCTION (6 HRS.)

Morphology of Mushrooms-Identification of mushrooms - Edible and poisonous mushrooms Nutritional and medicinal value of edible mushrooms- History of Mushroom cultivation – Present status of mushroom cultivation in India

Self-study- History of Mushroom cultivation – Present status of mushroom cultivation in India

UNIT –II COMPOSTING (6 HRS.)

Methods of Composting- Spawn production - Spawning- casing- Cropping and harvesting; Mushrooms farm design Construction and insulation – Growing rooms – Ventilation systems- Seasonal growing – casing pasteurization chamber

UNIT –III CULTIVATION (6 HRS.)

Cultivation techniques of edible mushrooms - *Pleurotus citrinopileatus* (Oyster mushroom) and *Agaricus bisporus* (Button mushroom)-Processing ,

grading and preservation of Mushrooms

UNIT –IV DISEASES AND PESTS (6 HRS.)

Management of fungal, bacterial and viral diseases in mushroom; Competitors, pests and nematodes in mushrooms- Precautions to avoid insects, pests and diseases

UNIT –V ECONOMICS OF MUSHROOM CULTIVATION (6 HRS.)

Economics of mushroom cultivation – Fixed costs, variable costs- Economics of canned products - Mushroom Export- Extension training and entrepreneurship - Mushroom Recipies

TEXT BOOKS

1.Jana B.L., (2014). *Mushroom culture.* Agrotech publishing company. Udaipur

2. Nita B., (2009). *Hand book on Mushrooms.* Oxford & IBH Publishers, New Delhi.

REFERENCES

1. Marimuthu T.,Krishnamoorthy A.S., Sivaprakasam K., & Jayarajan R., (1991).*OysterMushrooms.* Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan M., (1990). *Food and Nutrition.* Bappco, The Bangalore Printing and Publishing Co. Ltd., Bangalore.
3. Tewari, Pankaj K.S.C.,(1988). *Mushroom cultivation.* Mittal Publications, Delhi.
4. Muthusamy A.D., & Yesuraja I., (1999). *Mushroom Culture.* TNAU Publishers, New Delhi.
5. Tripathi D.P., (2005). *Mushroom Cultivation.* Oxford & IBH Publishers New Delhi

Digital Open Educational Resources (DOER) :

1. https://nios.ac.in/online-course-material/vocational-courses/certificate-in-mushroom-production-revised-(618).aspx
2. https://agrimoon.com/wp-content/uploads/Mashroom-culture.pdf

3. http://nsdl.niscair.res.in/jspui/bitstream/123456789/599/1/mushroom%20cultivation%20-%20Formatted.pdf
4. http://www.fao.org/3/i0522e/i0522e.pdf

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Identification of mushrooms	1	Chalk & Talk	Black Board
1.2	Edible and poisonous mushrooms	1	Chalk & Talk	LCD
1.3	Morphology of Mushrooms	4	Lecture	PPT & White board
1.4	Nutritional and medicinal value of edible mushrooms	1	Lecture	Smart Board
1.5	History of Mushroom cultivation	1	Lecture	Black Board
1.6	Present status of mushroom cultivation in India	1	Discussion	Google classroom
UNIT -2 COMPOSTING				
2.1	Methods of Composting	1	Lecture	Green Board Charts
2.2	Spawn production - Spawning- casing- Cropping and harvesting	2	Chalk & Talk	Green Board
2.3	Mushrooms farm design Construction and insulation	1	Lecture	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.4	Growing rooms – Ventilation systems- Seasonal growing – casing pasteurization chamber	2	Lecture	Smart Board
UNIT -3 CULTIVATION				
3.1	Cultivation techniques of edible mushrooms - *Pleurotus citrinopileatus* (Oyster mushroom)	2	Lecture	Smart Board
3.2	*Agaricus bisporus* (Button mushroom)-	2	Lecture	Black Board
3.3	Processing, grading and preservation of Mushrooms	2	Chalk &Talk	Black Board
UNIT -4 DISEASES AND PESTS				
4.1	Management of fungal, bacterial	1	Chalk & Talk	Green Board
4.2	viral diseases in mushroom	1	Chalk &Talk	Black Board
4.3	Competitors, pests and nematodes in mushrooms	2	Chalk & Talk	Green Board
4.4	Precautions to avoid insects, pests and diseases	2	Lecture	PPT & White board
UNIT -5 ECONOMICS OF MUSHROOM CULTIVATION				
5.1	Economics of mushroom cultivation – Fixed costs, variable costs	2	Lecture	Green Board Charts
5.2	Economics of canned products	1	Chalk & Talk	Green Board
5.3	Mushroom Export	1	Lecture	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.4	Extension training and entrepreneurship	1	Discussion	Google classroom
5.5	Mushroom Recipies	1	Discussion	Google classroom

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5 Mks	M1+M2 5+5=10 Mks.	MID-SEM TEST 15 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	7.5	-	7.5	18.75 %
K2	-	5	4	2 ½	11.5	-	11.5	28.75 %
K3	-	-	3	5	8	-	8	20 %
K4	-	-	3	5	8	-	8	20 %
Non Scholastic	-	-	-	-		5	5	12.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

**** The best out of two will be taken into account***

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO1	State the prospects of mushroom cultivation	K1	PSO1, PSO2& PSO9
CO2	Devise a plan for mushroom production unit	K4	PSO1,PSO2&PSO9
CO3	Outline the techniques in cultivation, grading & processing of edible mushrooms	K2	PSO1&PSO9
CO4	Identify and manage Insect-Pests and diseases affecting mushrooms.	K2	PSO1&PSO9
CO5	Prepare a business plan for small scale enterprise	K4	PSO1&PSO9

Mapping of COs with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11
CO1	3	3	2	3	3	3	-	3	3	-	3
CO2	3	3	2	3	3	3	-	3	3	-	3
CO3	3	3	2	3	3	3	-	3	3	-	3
CO4	3	3	2	3	3	3	-	3	3	-	3
CO5	3	3	2	3	3	3	-	3	3	-	3

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

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